

A three-term conjugate gradient method with nonmonotone line search for unconstrained optimization

ABSTRACT

The technique of nonmonotone line search has received much attention in nonlinear optimization. This technique can improve the computational cost of the line search process and increase the rate of convergence of the algorithm. However, the convergence of this line search scheme utilizes some rather restrictive assumption concerning the search directions, which may not hold for most conjugate gradient methods. Thus in this paper, we propose a three-term conjugate gradient method with nonmonotone backtracking line search technique for solving large scale unconstrained optimization problems. Convergence analysis of the proposed method is established under reasonable conditions. Numerical experiments carried out on benchmark test problems has clearly indicated the effectiveness of the developed algorithm in terms of efficiency and robustness.

Keyword: Nonmonotone line search; Unconstrained optimization; Symmetric rank-one update; Three-term conjugate gradient method

